



## SEQUENCE LISTING

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DEC 11 2001  
TECH CENTER 1600/2900

<110> Fu, C. Alan

<120> NOVEL GERMINAL CENTER KINASE CELL CYCLE PROTEINS, COMPOSITIONS AND METHODS OF USE

<130> A-68344-3/RMS/DHR

<140> US 09/645,456

<141> 2000-08-24

<150> US 09/425,324

<151> 1999-10-21

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Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
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Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
 50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
 65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
 85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
 100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys  
260 265 270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Glu Asn Asp Ser Gly  
325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg

340

345

350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
 355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Arg Glu Asn Glu Glu His Lys  
 370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
 385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
 405 410 415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
 420 425 430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg  
 435 440 445

Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu  
 450 455 460

Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu  
 465 470 475 480

Gln Arg Pro Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met  
 485 490 495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Val Glu Glu Arg Ser  
 500 505 510

Arg Leu Asn Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn  
 515 520 525

Arg Ile Ser Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile  
 530 535 540

Ser Gly Val Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp  
 545 550 555 560

Pro Gln Ile Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu  
 565 570 575

Thr Ala Ser Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly  
580 585 590

Phe Gln Glu Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg  
595 600 605

Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile  
610 615 620

Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro  
625 630 635 640

Pro Lys Val Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg  
645 650 655

Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser  
660 665 670

Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile  
675 680 685

Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser Ser  
690 695 700

Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly  
705 710 715 720

Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys  
725 730 735

Ser Glu Gly Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro  
740 745 750

Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Ser Tyr Lys  
755 760 765

Lys Ala Ile Asp Glu Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Glu  
770 775 780

Leu Arg Ile Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp Tyr  
785 790 795 800



Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Glu Asp  
805 810 815

Gly Glu Ser Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile Pro  
820 825 830

Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn Val  
835 840 845

Gly Met Val Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser Phe  
850 855 860

Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr Ser  
865 870 875 880

Gly Glu Lys Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala Gly  
885 890 895

His Ile Asn Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala Gly  
900 905 910

Thr Pro Thr Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu Met  
915 920 925

Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser Phe  
930 935 940

Thr Pro Phe Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp Glu  
945 950 955 960

Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser Glu  
965 970 975

Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile Ser  
980 985 990

Val Val Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr Pro  
995 1000 1005

Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys  
1010 1015 1020

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1040						1045					1050			
Ile	Asn	Arg	Arg	Arg	Phe	Gln	Gln	Met	Asp	Val	Leu	Glu	Gly	Leu
1055						1060					1065			
Asn	Val	Leu	Val	Thr	Ile	Ser	Gly	Lys	Lys	Asn	Lys	Leu	Arg	Val
1070						1075					1080			
Tyr	Tyr	Leu	Ser	Trp	Leu	Arg	Asn	Arg	Ile	Leu	His	Asn	Asp	Pro
1085						1090					1095			
Glu	Val	Glu	Lys	Lys	Gln	Gly	Trp	Ile	Thr	Val	Gly	Asp	Leu	Glu
1100						1105					1110			
Gly	Cys	Ile	His	Tyr	Lys	Val	Val	Lys	Tyr	Glu	Arg	Ile	Lys	Phe
1115						1120					1125			
Leu	Val	Ile	Ala	Leu	Lys	Asn	Ala	Val	Glu	Ile	Tyr	Ala	Trp	Ala
1130						1135					1140			
Pro	Lys	Pro	Tyr	His	Lys	Phe	Met	Ala	Phe	Lys	Ser	Phe	Ala	Asp
1145						1150					1155			
Leu	Gln	His	Lys	Pro	Leu	Leu	Val	Asp	Leu	Thr	Val	Glu	Glu	Gly
1160						1165					1170			
Gln	Arg	Leu	Lys	Val	Ile	Phe	Gly	Ser	His	Thr	Gly	Phe	His	Val
1175						1180					1185			
Ile	Asp	Val	Asp	Ser	Gly	Asn	Ser	Tyr	Asp	Ile	Tyr	Ile	Pro	Ser
1190						1195					1200			
His	Ile	Gln	Gly	Asn	Ile	Thr	Pro	His	Ala	Ile	Val	Ile	Leu	Pro
1205						1210					1215			
Lys	Thr	Asp	Gly	Met	Glu	Met	Leu	Val	Cys	Tyr	Glu	Asp	Glu	Gly
1220						1225					1230			
Val	Tyr	Val	Asn	Thr	Tyr	Gly	Arg	Ile	Thr	Lys	Asp	Val	Val	Leu

1235

1240

1245

Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn  
 1250 1255 1260

Gln Ile Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val  
 1265 1270 1275

Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln  
 1280 1285 1290

Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala  
 1295 1300 1305

Ser Val Arg Ser Gly Gly Ser Ser Gln Val Phe Phe Met Thr Leu  
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Asn Arg Asn Ser Met Met Asn Trp Glx  
 1325 1330

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Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
 50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
 65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys  
260 265 270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu

95

305		310		315		320									
Tyr	Glu	Tyr	Ser	Gly	Ser	Glu	Glu	Glu	Glu	Glu	Glu	Asn	Asp	Ser	Gly
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Glu	Pro	Ser	Ser	Ile	Leu	Asn	Leu	Pro	Gly	Glu	Ser	Thr	Leu	Arg	Arg
			340					345					350		
Asp	Phe	Leu	Arg	Leu	Gln	Leu	Ala	Asn	Lys	Glu	Arg	Ser	Glu	Ala	Leu
		355					360					365			
Arg	Arg	Gln	Gln	Leu	Glu	Gln	Gln	Gln	Arg	Glu	Asn	Glu	Glu	His	Lys
	370					375					380				
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385					390					395					400
Gln	Arg	Arg	Arg	Leu	Glu	Glu	Gln	Gln	Arg	Arg	Glu	Lys	Glu	Leu	Arg
				405					410					415	
Lys	Gln	Gln	Glu	Arg	Glu	Gln	Arg	Arg	His	Tyr	Glu	Glu	Gln	Met	Arg
			420					425					430		
Arg	Glu	Glu	Glu	Arg	Arg	Arg	Ala	Glu	His	Glu	Gln	Glu	Tyr	Ile	Arg
	435						440					445			
Arg	Gln	Leu	Glu	Glu	Glu	Gln	Arg	Gln	Leu	Glu	Ile	Leu	Gln	Gln	Gln
	450					455					460				
Leu	Leu	His	Glu	Gln	Ala	Leu	Leu	Leu	Glu	Tyr	Lys	Arg	Lys	Gln	Leu
465					470					475					480
Glu	Glu	Gln	Arg	Gln	Ala	Glu	Arg	Leu	Gln	Arg	Gln	Leu	Lys	Gln	Glu
				485					490					495	
Arg	Asp	Tyr	Leu	Val	Ser	Leu	Gln	His	Gln	Arg	Gln	Glu	Gln	Arg	Pro
			500					505					510		
Val	Glu	Lys	Lys	Pro	Leu	Tyr	His	Tyr	Lys	Glu	Gly	Met	Ser	Pro	Ser
		515					520					525			
Glu	Lys	Pro	Ala	Trp	Ala	Lys	Glu	Ile	Pro	His	Leu	Val	Ala	Val	Lys
	530					535					540				

96

Ser Gln Gly Pro Ala Leu Thr Ala Ser Gln Ser Val His Glu Gln Pro  
545 550 555 560

Thr Lys Gly Leu Ser Gly Phe Gln Glu Ala Leu Asn Val Thr Ser His  
565 570 575

Arg Val Glu Met Pro Arg Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro  
580 585 590

Pro Leu Pro Thr Arg Ile Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg  
595 600 605

Gln Glu Glu Asp Ile Pro Pro Lys Val Pro Gln Arg Thr Thr Ser Ile  
610 615 620

Ser Pro Ala Leu Ala Arg Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu  
625 630 635 640

Gly Pro Arg Leu Gly Ser Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu  
645 650 655

Arg Arg Thr Glu Pro Ile Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser  
660 665 670

Gly Ser Ser Ser Ser Ser Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln  
675 680 685

Gly Gly Ser Gln Pro Gly Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg  
690 695 700

Val Arg Ala Asn Ser Lys Ser Glu Gly Ser Pro Val Leu Pro His Glu  
705 710 715 720

Pro Ala Lys Val Lys Pro Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser  
725 730 735

Arg Pro Ala Ser Tyr Lys Lys Ala Ile Asp Glu Asp Leu Thr Ala Leu  
740 745 750

Ala Lys Glu Leu Arg Glu Leu Arg Ile Glu Glu Thr Asn Arg Pro Met  
755 760 765

Lys Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser  
770 775 780

Glu Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp Gly Thr Val  
785 790 795 800

Ala Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser  
805 810 815

Asn Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly Leu Glu Thr  
820 825 830

Ser His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu  
835 840 845

Met Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly His Ser Asp  
850 855 860

Ser Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu Val Gln Gln  
865 870 875 880

Ser His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly Arg Val Ser  
885 890 895

Thr His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser  
900 905 910

Ser Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg Val Tyr Gln  
915 920 925

Thr Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala  
930 935 940

Ala Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn  
945 950 955 960

Glu Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr Asn Ile Arg  
965 970 975

Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn  
980 985 990

Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly  
995 1000 1005

Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly Gln Gly Lys  
1010 1015 1020

Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln Met Asp Val  
1025 1030 1035

Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly Lys Lys Asn  
1040 1045 1050

Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu  
1055 1060 1065

His Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp Ile Thr Val  
1070 1075 1080

Gly Asp Leu Glu Gly Cys Ile His Tyr Lys Val Val Lys Tyr Glu  
1085 1090 1095

Arg Ile Lys Phe Leu Val Ile Ala Leu Lys Asn Ala Val Glu Ile  
1100 1105 1110

Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys Phe Met Ala Phe Lys  
1115 1120 1125

Ser Phe Ala Asp Leu Gln His Lys Pro Leu Leu Val Asp Leu Thr  
1130 1135 1140

Val Glu Glu Gly Gln Arg Leu Lys Val Ile Phe Gly Ser His Thr  
1145 1150 1155

Gly Phe His Val Ile Asp Val Asp Ser Gly Asn Ser Tyr Asp Ile  
1160 1165 1170

Tyr Ile Pro Ser His Ile Gln Gly Asn Ile Thr Pro His Ala Ile  
1175 1180 1185

Val Ile Leu Pro Lys Thr Asp Gly Met Glu Met Leu Val Cys Tyr  
1190 1195 1200

Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys

99



1205

1210

1215

Asp Val Val Leu Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr  
 1220 1225 1230

Ile His Ser Asn Gln Ile Met Gly Trp Gly Glu Lys Ala Ile Glu  
 1235 1240 1245

Ile Arg Ser Val Glu Thr Gly His Leu Asp Gly Val Phe Met His  
 1250 1255 1260

Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys  
 1265 1270 1275

Val Phe Phe Ala Ser Val Arg Ser Gly Gly Ser Ser Gln Val Phe  
 1280 1285 1290

Phe Met Thr Leu Asn Arg Asn Ser Met Met Asn Trp Glx  
 1295 1300 1305

<210> 11  
 <211> 1353  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<400> 11

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser  
 1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
 50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
 65 70 75 80

100

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys  
260 265 270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu

305		310		315		320									
Tyr	Glu	Tyr	Ser	Gly	Ser	Glu	Glu	Glu	Glu	Glu	Glu	Asn	Asp	Ser	Gly
				325					330					335	
Glu	Pro	Ser	Ser	Ile	Leu	Asn	Leu	Pro	Gly	Glu	Ser	Thr	Leu	Arg	Arg
			340					345					350		
Asp	Phe	Leu	Arg	Leu	Gln	Leu	Ala	Asn	Lys	Glu	Arg	Ser	Glu	Ala	Leu
		355					360					365			
Arg	Arg	Gln	Gln	Leu	Glu	Gln	Gln	Gln	Arg	Glu	Asn	Glu	Glu	His	Lys
	370					375					380				
Arg	Gln	Leu	Leu	Ala	Glu	Arg	Gln	Lys	Arg	Ile	Glu	Glu	Gln	Lys	Glu
385					390					395					400
Gln	Arg	Arg	Arg	Leu	Glu	Glu	Gln	Gln	Arg	Arg	Glu	Lys	Glu	Leu	Arg
				405					410					415	
Lys	Gln	Gln	Glu	Arg	Glu	Gln	Arg	Arg	His	Tyr	Glu	Glu	Gln	Met	Arg
			420					425					430		
Arg	Glu	Glu	Glu	Arg	Arg	Arg	Ala	Glu	His	Glu	Gln	Glu	Tyr	Ile	Arg
		435					440					445			
Arg	Gln	Leu	Glu	Glu	Glu	Gln	Arg	Gln	Leu	Glu	Ile	Leu	Gln	Gln	Gln
	450					455					460				
Leu	Leu	His	Glu	Gln	Ala	Leu	Leu	Leu	Glu	Tyr	Lys	Arg	Lys	Gln	Leu
465					470					475					480
Glu	Glu	Gln	Arg	Gln	Ala	Glu	Arg	Leu	Gln	Arg	Gln	Leu	Lys	Gln	Glu
				485					490					495	
Arg	Asp	Tyr	Leu	Val	Ser	Leu	Gln	His	Gln	Arg	Gln	Glu	Gln	Arg	Pro
			500					505					510		
Val	Glu	Lys	Lys	Pro	Leu	Tyr	His	Tyr	Lys	Glu	Gly	Met	Ser	Pro	Ser
		515					520					525			
Glu	Lys	Pro	Ala	Trp	Ala	Lys	Glu	Val	Glu	Glu	Arg	Ser	Arg	Leu	Asn
	530					535					540				

102

Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn Arg Ile Ser  
545 550 555 560

Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile Ser Gly Val  
565 570 575

Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp Pro Gln Ile  
580 585 590

Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu Thr Ala Ser  
595 600 605

Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly Phe Gln Glu  
610 615 620

Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg Gln Asn Ser  
625 630 635 640

Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile Glu Lys Phe  
645 650 655

Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro Pro Lys Val  
660 665 670

Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg Lys Asn Ser  
675 680 685

Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser Gln Pro Ile  
690 695 700

Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile Leu Glu Ser  
705 710 715 720

Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser Ser Thr Pro  
725 730 735

Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly Ser Gln Ala  
740 745 750

Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys Ser Glu Gly  
755 760 765

Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro Glu Glu Ser  
770 775 780

Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Asp Leu Thr Ala Leu Ala  
785 790 795 800

Lys Glu Leu Arg Glu Leu Arg Ile Glu Glu Thr Asn Arg Pro Met Lys  
805 810 815

Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser Glu  
820 825 830

Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp Gly Thr Val Ala  
835 840 845

Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser Asn  
850 855 860

Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly Leu Glu Thr Ser  
865 870 875 880

His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu Met  
885 890 895

Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly His Ser Asp Ser  
900 905 910

Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu Val Gln Gln Ser  
915 920 925

His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly Arg Val Ser Thr  
930 935 940

His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser Ser  
945 950 955 960

Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg Val Tyr Gln Thr  
965 970 975

Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala Ala  
980 985 990

Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn Glu  
 995 1000 1005

Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr Asn Ile Arg  
 1010 1015 1020

Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys Arg Phe  
 1025 1030 1035

Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu Leu  
 1040 1045 1050

Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly Gln  
 1055 1060 1065

Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln Met  
 1070 1075 1080

Asp Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly Lys  
 1085 1090 1095

Lys Asn Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn Arg  
 1100 1105 1110

Ile Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp Ile  
 1115 1120 1125

Thr Val Gly Asp Leu Glu Gly Cys Ile His Tyr Lys Val Val Lys  
 1130 1135 1140

Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys Asn Ala Val  
 1145 1150 1155

Glu Ile Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys Phe Met Ala  
 1160 1165 1170

Phe Lys Ser Phe Ala Asp Leu Gln His Lys Pro Leu Leu Val Asp  
 1175 1180 1185

Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Phe Gly Ser  
 1190 1195 1200

His Thr Gly Phe His Val Ile Asp Val Asp Ser Gly Asn Ser Tyr

105

1205

1210

1215

Asp Ile Tyr Ile Pro Ser His Ile Gln Gly Asn Ile Thr Pro His  
 1220 1225 1230

Ala Ile Val Ile Leu Pro Lys Thr Asp Gly Met Glu Met Leu Val  
 1235 1240 1245

Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr Gly Arg Ile  
 1250 1255 1260

Thr Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro Thr Ser Val  
 1265 1270 1275

Ala Tyr Ile His Ser Asn Gln Ile Met Gly Trp Gly Glu Lys Ala  
 1280 1285 1290

Ile Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp Gly Val Phe  
 1295 1300 1305

Met His Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys Glu Arg Asn  
 1310 1315 1320

Asp Lys Val Phe Phe Ala Ser Val Arg Ser Gly Gly Ser Ser Gln  
 1325 1330 1335

Val Phe Phe Met Thr Leu Asn Arg Asn Ser Met Met Asn Trp Glx  
 1340 1345 1350

<210> 12  
 <211> 1277  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<400> 12

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser  
 1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys



260

265

270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
 275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
 290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
 305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Asn Asp Ser Gly  
 325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg  
 340 345 350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
 355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Arg Glu Asn Glu Glu His Lys  
 370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
 385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
 405 410 415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
 420 425 430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg  
 435 440 445

Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu  
 450 455 460

Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu  
 465 470 475 480

Gln Arg Pro Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met  
 485 490 495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Ile Pro His Leu Val  
500 505 510

Ala Val Lys Ser Gln Gly Pro Ala Leu Thr Ala Ser Gln Ser Val His  
515 520 525

Glu Gln Pro Thr Lys Gly Leu Ser Gly Phe Gln Glu Ala Leu Asn Val  
530 535 540

Thr Ser His Arg Val Glu Met Pro Arg Gln Asn Ser Asp Pro Thr Ser  
545 550 555 560

Glu Asn Pro Pro Leu Pro Thr Arg Ile Glu Lys Phe Asp Arg Ser Ser  
565 570 575

Trp Leu Arg Gln Glu Glu Asp Ile Pro Pro Lys Val Pro Gln Arg Thr  
580 585 590

Thr Ser Ile Ser Pro Ala Leu Ala Arg Lys Asn Ser Pro Gly Asn Gly  
595 600 605

Ser Ala Leu Gly Pro Arg Leu Gly Ser Gln Pro Ile Arg Ala Ser Asn  
610 615 620

Pro Asp Leu Arg Arg Thr Glu Pro Ile Leu Glu Ser Pro Leu Gln Arg  
625 630 635 640

Thr Ser Ser Gly Ser Ser Ser Ser Ser Ser Thr Pro Ser Ser Gln Pro  
645 650 655

Ser Ser Gln Gly Gly Ser Gln Pro Gly Ser Gln Ala Gly Ser Ser Glu  
660 665 670

Arg Thr Arg Val Arg Ala Asn Ser Lys Ser Glu Gly Ser Pro Val Leu  
675 680 685

Pro His Glu Pro Ala Lys Val Lys Pro Glu Glu Ser Arg Asp Ile Thr  
690 695 700

Arg Pro Ser Arg Pro Ala Ser Tyr Lys Lys Ala Ile Asp Glu Asp Leu  
705 710 715 720

Thr Ala Leu Ala Lys Glu Leu Arg Glu Leu Arg Ile Glu Glu Thr Asn  
725 730 735

Arg Pro Met Lys Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser  
740 745 750

Glu Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp  
755 760 765

Gly Thr Val Ala Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala  
770 775 780

Pro Gly Ser Asn Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly  
785 790 795 800

Leu Glu Thr Ser His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu  
805 810 815

Gly Thr Leu Met Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly  
820 825 830

His Ser Asp Ser Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu  
835 840 845

Val Gln Gln Ser His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly  
850 855 860

Arg Val Ser Thr His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly  
865 870 875 880

Met Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg  
885 890 895

Val Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser  
900 905 910

Ser Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala  
915 920 925

Lys Leu Asn Glu Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr  
930 935 940

Asn Ile Arg Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys  
945 950 955 960

Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu  
965 970 975

Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly Gln  
980 985 990

Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln Met Asp  
995 1000 1005

Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly Lys Lys  
1010 1015 1020

Asn Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn Arg Ile  
1025 1030 1035

Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp Ile Thr  
1040 1045 1050

Val Gly Asp Leu Glu Gly Cys Ile His Tyr Lys Val Val Lys Tyr  
1055 1060 1065

Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys Asn Ala Val Glu  
1070 1075 1080

Ile Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys Phe Met Ala Phe  
1085 1090 1095

Lys Ser Phe Ala Asp Leu Gln His Lys Pro Leu Leu Val Asp Leu  
1100 1105 1110

Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Phe Gly Ser His  
1115 1120 1125

Thr Gly Phe His Val Ile Asp Val Asp Ser Gly Asn Ser Tyr Asp  
1130 1135 1140

Ile Tyr Ile Pro Ser His Ile Gln Gly Asn Ile Thr Pro His Ala  
1145 1150 1155

Ile Val Ile Leu Pro Lys Thr Asp Gly Met Glu Met Leu Val Cys

111

1160

1165

1170

Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr  
 1175 1180 1185

Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro Thr Ser Val Ala  
 1190 1195 1200

Tyr Ile His Ser Asn Gln Ile Met Gly Trp Gly Glu Lys Ala Ile  
 1205 1210 1215

Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp Gly Val Phe Met  
 1220 1225 1230

His Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp  
 1235 1240 1245

Lys Val Phe Phe Ala Ser Val Arg Ser Gly Gly Ser Ser Gln Val  
 1250 1255 1260

Phe Phe Met Thr Leu Asn Arg Asn Ser Met Met Asn Trp Glx  
 1265 1270 1275

<210> 13  
 <211> 1324  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<400> 13

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser  
 1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
 35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
 50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys  
260 265 270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp

290

295

300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Asn Asp Ser Gly  
325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg  
340 345 350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Gln Arg Glu Asn Glu Glu His Lys  
370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
405 410 415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
420 425 430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg  
435 440 445

Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu  
450 455 460

Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu  
465 470 475 480

Gln Arg Pro Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met  
485 490 495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Val Glu Glu Arg Ser  
500 505 510

Arg Leu Asn Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn  
515 520 525

Arg Ile Ser Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile  
530 535 540

Ser Gly Val Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp  
545 550 555 560

Pro Gln Ile Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu  
565 570 575

Thr Ala Ser Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly  
580 585 590

Phe Gln Glu Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg  
595 600 605

Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile  
610 615 620

Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro  
625 630 635 640

Pro Lys Val Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg  
645 650 655

Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser  
660 665 670

Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile  
675 680 685

Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser Ser  
690 695 700

Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly  
705 710 715 720

Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys  
725 730 735

Ser Glu Gly Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro  
740 745 750



Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Asp Leu Thr  
755 760 765

Ala Leu Ala Lys Glu Leu Arg Glu Leu Arg Ile Glu Glu Thr Asn Arg  
770 775 780

Pro Met Lys Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser Glu  
785 790 795 800

Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu Ser Glu Thr His Asp Gly  
805 810 815

Thr Val Ala Val Ser Asp Ile Pro Arg Leu Ile Pro Thr Gly Ala Pro  
820 825 830

Gly Ser Asn Glu Gln Tyr Asn Val Gly Met Val Gly Thr His Gly Leu  
835 840 845

Glu Thr Ser His Ala Asp Ser Phe Ser Gly Ser Ile Ser Arg Glu Gly  
850 855 860

Thr Leu Met Ile Arg Glu Thr Ser Gly Glu Lys Lys Arg Ser Gly His  
865 870 875 880

Ser Asp Ser Asn Gly Phe Ala Gly His Ile Asn Leu Pro Asp Leu Val  
885 890 895

Gln Gln Ser His Ser Pro Ala Gly Thr Pro Thr Glu Gly Leu Gly Arg  
900 905 910

Val Ser Thr His Ser Gln Glu Met Asp Ser Gly Thr Glu Tyr Gly Met  
915 920 925

Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro Phe Val Asp Pro Arg Val  
930 935 940

Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu Glu Asp Glu Glu Ser Ser  
945 950 955 960

Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu Arg Gln Glu Gln Ala Lys  
965 970 975

Leu Asn Glu Ala Arg Lys Ile Ser Val Val Asn Val Asn Pro Thr Asn  
980 985 990

Ile Arg Pro His Ser Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys Arg  
995 1000 1005

Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly Val Asn Leu  
1010 1015 1020

Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg Ser Gly  
1025 1030 1035

Gln Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg Arg Phe Gln Gln  
1040 1045 1050

Met Asp Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile Ser Gly  
1055 1060 1065

Lys Lys Asn Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg Asn  
1070 1075 1080

Arg Ile Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp  
1085 1090 1095

Ile Thr Val Gly Asp Leu Glu Gly Cys Ile His Tyr Lys Val Val  
1100 1105 1110

Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys Asn Ala  
1115 1120 1125

Val Glu Ile Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys Phe Met  
1130 1135 1140

Ala Phe Lys Ser Phe Ala Asp Leu Gln His Lys Pro Leu Leu Val  
1145 1150 1155

Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Phe Gly  
1160 1165 1170

Ser His Thr Gly Phe His Val Ile Asp Val Asp Ser Gly Asn Ser  
1175 1180 1185

Tyr Asp Ile Tyr Ile Pro Ser His Ile Gln Gly Asn Ile Thr Pro

1190

1195

1200

His Ala Ile Val Ile Leu Pro Lys Thr Asp Gly Met Glu Met Leu  
 1205 1210 1215

Val Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr Gly Arg  
 1220 1225 1230

Ile Thr Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro Thr Ser  
 1235 1240 1245

Val Ala Tyr Ile His Ser Asn Gln Ile Met Gly Trp Gly Glu Lys  
 1250 1255 1260

Ala Ile Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp Gly Val  
 1265 1270 1275

Phe Met His Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys Glu Arg  
 1280 1285 1290

Asn Asp Lys Val Phe Phe Ala Ser Val Arg Ser Gly Gly Ser Ser  
 1295 1300 1305

Gln Val Phe Phe Met Thr Leu Asn Arg Asn Ser Met Met Asn Trp  
 1310 1315 1320

Glx

&lt;210&gt; 14

&lt;211&gt; 1298

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; synthetic

&lt;400&gt; 14

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser  
 1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys

119

260

265

270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
 275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
 290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
 305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Glu Asn Asp Ser Gly  
 325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg  
 340 345 350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
 355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Gln Arg Glu Asn Glu Glu His Lys  
 370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
 385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
 405 410 415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
 420 425 430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Ile Arg  
 435 440 445

Arg Gln Leu Glu Glu Glu Gln Arg Gln Leu Glu Ile Leu Gln Gln Gln  
 450 455 460

Leu Leu His Glu Gln Ala Leu Leu Leu Glu Tyr Lys Arg Lys Gln Leu  
 465 470 475 480

Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu Lys Gln Glu  
 485 490 495

Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu Gln Arg Pro  
500 505 510

Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met Ser Pro Ser  
515 520 525

Glu Lys Pro Ala Trp Ala Lys Glu Ile Pro His Leu Val Ala Val Lys  
530 535 540

Ser Gln Gly Pro Ala Leu Thr Ala Ser Gln Ser Val His Glu Gln Pro  
545 550 555 560

Thr Lys Gly Leu Ser Gly Phe Gln Glu Ala Leu Asn Val Thr Ser His  
565 570 575

Arg Val Glu Met Pro Arg Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro  
580 585 590

Pro Leu Pro Thr Arg Ile Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg  
595 600 605

Gln Glu Glu Asp Ile Pro Pro Lys Val Pro Gln Arg Thr Thr Ser Ile  
610 615 620

Ser Pro Ala Leu Ala Arg Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu  
625 630 635 640

Gly Pro Arg Leu Gly Ser Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu  
645 650 655

Arg Arg Thr Glu Pro Ile Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser  
660 665 670

Gly Ser Ser Ser Ser Ser Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln  
675 680 685

Gly Gly Ser Gln Pro Gly Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg  
690 695 700

Val Arg Ala Asn Ser Lys Ser Glu Gly Ser Pro Val Leu Pro His Glu  
705 710 715 720

Pro Ala Lys Val Lys Pro Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser  
725 730 735

Arg Pro Ala Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Glu Leu Arg  
740 745 750

Ile Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp Tyr Ser Ser  
755 760 765

Ser Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu  
770 775 780

Ser Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile Pro Arg Leu  
785 790 795 800

Ile Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn Val Gly Met  
805 810 815

Val Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser Phe Ser Gly  
820 825 830

Ser Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr Ser Gly Glu  
835 840 845

Lys Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala Gly His Ile  
850 855 860

Asn Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala Gly Thr Pro  
865 870 875 880

Thr Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu Met Asp Ser  
885 890 895

Gly Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro  
900 905 910

Phe Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu  
915 920 925

Glu Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu  
930 935 940

Arg Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile Ser Val Val  
 945 950 955 960

Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr Pro Glu Ile  
 965 970 975

Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu  
 980 985 990

Trp Gly Val Asn Leu Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu  
 995 1000 1005

Asp Arg Ser Gly Gln Gly Lys Val Tyr Asn Leu Ile Asn Arg Arg  
 1010 1015 1020

Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn Val Leu Val  
 1025 1030 1035

Thr Ile Ser Gly Lys Lys Asn Lys Leu Arg Val Tyr Tyr Leu Ser  
 1040 1045 1050

Trp Leu Arg Asn Arg Ile Leu His Asn Asp Pro Glu Val Glu Lys  
 1055 1060 1065

Lys Gln Gly Trp Ile Thr Val Gly Asp Leu Glu Gly Cys Ile His  
 1070 1075 1080

Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala  
 1085 1090 1095

Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala Pro Lys Pro Tyr  
 1100 1105 1110

His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp Leu Gln His Lys  
 1115 1120 1125

Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys  
 1130 1135 1140

Val Ile Phe Gly Ser His Thr Gly Phe His Val Ile Asp Val Asp  
 1145 1150 1155

Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser His Ile Gln Gly



1160

1165

1170

Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro Lys Thr Asp Gly  
 1175 1180 1185

Met Glu Met Leu Val Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn  
 1190 1195 1200

Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu Gln Trp Gly Glu  
 1205 1210 1215

Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn Gln Ile Met Gly  
 1220 1225 1230

Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val Glu Thr Gly His  
 1235 1240 1245

Leu Asp Gly Val Phe Met His Lys Arg Ala Gln Arg Leu Lys Phe  
 1250 1255 1260

Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala Ser Val Arg Ser  
 1265 1270 1275

Gly Gly Ser Ser Gln Val Phe Phe Met Thr Leu Asn Arg Asn Ser  
 1280 1285 1290

Met Met Asn Trp Glx  
 1295

<210> 15

<211> 1269

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 15

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser  
 1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys

260

265

270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
 275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
 290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
 305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Glu Asn Asp Ser Gly  
 325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg  
 340 345 350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
 355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Arg Glu Asn Glu Glu His Lys  
 370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
 385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
 405 410 415

Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
 420 425 430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg  
 435 440 445

Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu  
 450 455 460

Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu  
 465 470 475 480

Gln Arg Pro Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met  
 485 490 495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Ile Pro His Leu Val  
500 505 510

Ala Val Lys Ser Gln Gly Pro Ala Leu Thr Ala Ser Gln Ser Val His  
515 520 525

Glu Gln Pro Thr Lys Gly Leu Ser Gly Phe Gln Glu Ala Leu Asn Val  
530 535 540

Thr Ser His Arg Val Glu Met Pro Arg Gln Asn Ser Asp Pro Thr Ser  
545 550 555 560

Glu Asn Pro Pro Leu Pro Thr Arg Ile Glu Lys Phe Asp Arg Ser Ser  
565 570 575

Trp Leu Arg Gln Glu Glu Asp Ile Pro Pro Lys Val Pro Gln Arg Thr  
580 585 590

Thr Ser Ile Ser Pro Ala Leu Ala Arg Lys Asn Ser Pro Gly Asn Gly  
595 600 605

Ser Ala Leu Gly Pro Arg Leu Gly Ser Gln Pro Ile Arg Ala Ser Asn  
610 615 620

Pro Asp Leu Arg Arg Thr Glu Pro Ile Leu Glu Ser Pro Leu Gln Arg  
625 630 635 640

Thr Ser Ser Gly Ser Ser Ser Ser Ser Ser Thr Pro Ser Ser Gln Pro  
645 650 655

Ser Ser Gln Gly Gly Ser Gln Pro Gly Ser Gln Ala Gly Ser Ser Glu  
660 665 670

Arg Thr Arg Val Arg Ala Asn Ser Lys Ser Glu Gly Ser Pro Val Leu  
675 680 685

Pro His Glu Pro Ala Lys Val Lys Pro Glu Glu Ser Arg Asp Ile Thr  
690 695 700

Arg Pro Ser Arg Pro Ala Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg  
705 710 715 720

127

Glu Leu Arg Ile Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp  
725 730 735

Tyr Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Glu  
740 745 750

Asp Gly Glu Ser Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile  
755 760 765

Pro Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn  
770 775 780

Val Gly Met Val Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser  
785 790 795 800

Phe Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr  
805 810 815

Ser Gly Glu Lys Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala  
820 825 830

Gly His Ile Asn Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala  
835 840 845

Gly Thr Pro Thr Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu  
850 855 860

Met Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser  
865 870 875 880

Phe Thr Pro Phe Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp  
885 890 895

Glu Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser  
900 905 910

Glu Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile  
915 920 925

Ser Val Val Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr  
930 935 940

Pro Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys  
945 950 955 960

Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Asn Gly Leu  
965 970 975

Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Asn Leu Ile Asn  
980 985 990

Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn Val Leu  
995 1000 1005

Val Thr Ile Ser Gly Lys Lys Asn Lys Leu Arg Val Tyr Tyr Leu  
1010 1015 1020

Ser Trp Leu Arg Asn Arg Ile Leu His Asn Asp Pro Glu Val Glu  
1025 1030 1035

Lys Lys Gln Gly Trp Ile Thr Val Gly Asp Leu Glu Gly Cys Ile  
1040 1045 1050

His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile  
1055 1060 1065

Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala Pro Lys Pro  
1070 1075 1080

Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp Leu Gln His  
1085 1090 1095

Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu  
1100 1105 1110

Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val Ile Asp Val  
1115 1120 1125

Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser His Ile Gln  
1130 1135 1140

Gly Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro Lys Thr Asp  
1145 1150 1155

Gly Met Glu Met Leu Val Cys Tyr Glu Asp Glu Gly Val Tyr Val

1160

1165

1170

Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu Gln Trp Gly  
 1175 1180 1185

Glu Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn Gln Ile Met  
 1190 1195 1200

Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val Glu Thr Gly  
 1205 1210 1215

His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln Arg Leu Lys  
 1220 1225 1230

Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala Ser Val Arg  
 1235 1240 1245

Ser Gly Gly Ser Ser Gln Val Phe Phe Met Thr Leu Asn Arg Asn  
 1250 1255 1260

Ser Met Met Asn Trp Glx  
 1265

<210> 16  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<400> 16

Arg Thr Val Leu Gly Val Ile Gly Asp  
 1 5

<210> 17  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<400> 17

Arg Thr Ala Leu Gly Ile Asp Gly Asn  
 1 5

130

<210> 18  
<211> 27  
<212> PRT  
<213> Rattus sp.

<400> 18

Tyr Met Thr Val Ser Ile Ile Asp Arg Phe Met Gln Asp Ser Cys Val  
1 5 10 15

Pro Lys Lys Met Leu Gln Leu Val Gly Val Thr  
20 25

<210> 19  
<211> 28  
<212> PRT  
<213> Mus sp.

<400> 19

Lys Phe Arg Leu Leu Gln Glu Thr Met Tyr Met Thr Val Ser Ile Ile  
1 5 10 15

Asp Arg Phe Met Gln Asn Ser Cys Val Pro Lys Lys  
20 25

<210> 20  
<211> 27  
<212> PRT  
<213> Mus. sp.

<400> 20

Arg Ala Ile Leu Ile Asp Trp Leu Ile Gln Val Gln Met Lys Phe Arg  
1 5 10 15

Leu Leu Gln Glu Thr Met Tyr Met Thr Val Ser  
20 25

<210> 21  
<211> 27  
<212> PRT  
<213> Mus sp.

<400> 21

Asp Arg Phe Leu Gln Ala Gln Leu Val Cys Arg Lys Lys Leu Gln Val  
1 5 10 15

131



Val Gly Ile Thr Ala Leu Leu Leu Ala Ser Lys  
20 25

<210> 22  
<211> 18  
<212> PRT  
<213> Mus sp.

<400> 22

Met Ser Val Leu Arg Gly Lys Leu Gln Leu Val Gly Thr Ala Ala Met  
1 5 10 15

Leu Leu

<210> 23  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 23  
tgcgcttata ttccagaagt agagct

26

<210> 24  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 24  
ctgtctctgc tcctcctcta

20

<210> 25  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 25

Ala Tyr Pro Tyr Asp Val Pro Asp Tyr Ala  
1 5 10

132

<210> 26  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 26  
agcttcgagc catcagggtt atggatgtca c

31

<210> 27  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 27  
gtgacatcca taaccttgat ggctgcaagc t

31

<210> 28  
<211> 9  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 28

Asp Tyr Lys Asp Asp Asp Lys Gly  
1 5

<210> 29  
<211> 14  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 29

Ala Ser Met Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Asn  
1 5 10

<210> 30  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 30

Pro Cys Pro Pro Ser Arg  
1 5

<210> 31  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 31

Pro Arg Val Pro Val Arg  
1 5

<210> 32  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 32

Pro Asn Leu Pro Pro Arg  
1 5

<210> 33  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 33

Pro Lys Val Pro Gln Arg  
1 5

<210> 34  
<211> 1360  
<212> PRT  
<213> Artificial Sequence

134

<220>

<223> synthetic

<400> 34

Met Ala Ser Asp Ser Pro Ala Arg Ser Leu Asp Glu Ile Asp Leu Ser  
1 5 10 15

Ala Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Leu Val Gly  
20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
 210 215 220  
 Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
 225 230 235 240  
 Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
 245 250 255  
 Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys  
 260 265 270  
 Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
 275 280 285  
 Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
 290 295 300  
 His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
 305 310 315 320  
 Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Asn Asp Ser Gly  
 325 330 335  
 Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg  
 340 345 350  
 Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
 355 360 365  
 Arg Arg Gln Gln Leu Glu Gln Gln Gln Arg Glu Asn Glu Glu His Lys  
 370 375 380  
 Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
 385 390 395 400  
 Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
 405 410 415  
 Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
 420 425 430  
 Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Ile Arg

136

435

440

445

Arg Gln Leu Glu Glu Glu Gln Arg Gln Leu Glu Ile Leu Gln Gln Gln  
 450 455 460

Leu Leu His Glu Gln Ala Leu Leu Leu Glu Tyr Lys Arg Lys Gln Leu  
 465 470 475 480

Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu Lys Gln Glu  
 485 490 495

Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu Gln Arg Pro  
 500 505 510

Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met Ser Pro Ser  
 515 520 525

Glu Lys Pro Ala Trp Ala Lys Glu Val Glu Glu Arg Ser Arg Leu Asn  
 530 535 540

Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn Arg Ile Ser  
 545 550 555 560

Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile Ser Gly Val  
 565 570 575

Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp Pro Gln Ile  
 580 585 590

Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu Thr Ala Ser  
 595 600 605

Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly Phe Gln Glu  
 610 615 620

Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg Gln Asn Ser  
 625 630 635 640

Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile Glu Lys Phe  
 645 650 655

Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro Pro Lys Val  
 660 665 670

131

Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg Lys Asn Ser  
675 680 685

Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser Gln Pro Ile  
690 695 700

Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile Leu Glu Ser  
705 710 715 720

Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser Ser Ser Thr Pro  
725 730 735

Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly Ser Gln Ala  
740 745 750

Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys Ser Glu Gly  
755 760 765

Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro Glu Glu Ser  
770 775 780

Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Ser Tyr Lys Lys Ala Ile  
785 790 795 800

Asp Glu Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Glu Leu Arg Ile  
805 810 815

Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp Tyr Ser Ser Ser  
820 825 830

Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Glu Asp Gly Glu Ser  
835 840 845

Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile Pro Arg Leu Ile  
850 855 860

Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn Val Gly Met Val  
865 870 875 880

Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser Phe Ser Gly Ser  
885 890 895

138

Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr Ser Gly Glu Lys  
900 905 910

Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala Gly His Ile Asn  
915 920 925

Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala Gly Thr Pro Thr  
930 935 940

Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu Met Asp Ser Gly  
945 950 955 960

Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser Phe Thr Pro Phe  
965 970 975

Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp Glu Asp Glu Glu  
980 985 990

Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser Glu Leu Leu Arg  
995 1000 1005

Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile Ser Val Val  
1010 1015 1020

Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr Pro Glu  
1025 1030 1035

Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys Ala  
1040 1045 1050

Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Asn Gly Leu  
1055 1060 1065

Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Asn Leu Ile  
1070 1075 1080

Asn Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn  
1085 1090 1095

Val Leu Val Thr Ile Ser Gly Lys Lys Asn Lys Leu Arg Val Tyr  
1100 1105 1110



Tyr Leu Ser Trp Leu Arg Asn Arg Ile Leu His Asn Asp Pro Glu  
1115 1120 1125

Val Glu Lys Lys Gln Gly Trp Ile Thr Val Gly Asp Leu Glu Gly  
1130 1135 1140

Cys Ile His Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe Leu  
1145 1150 1155

Val Ile Ala Leu Lys Asn Ala Val Glu Ile Tyr Ala Trp Ala Pro  
1160 1165 1170

Lys Pro Tyr His Lys Phe Met Ala Phe Lys Ser Phe Ala Asp Leu  
1175 1180 1185

Gln His Lys Pro Leu Leu Val Asp Leu Thr Val Glu Glu Gly Gln  
1190 1195 1200

Arg Leu Lys Val Ile Phe Gly Ser His Thr Gly Phe His Val Ile  
1205 1210 1215

Asp Val Asp Ser Gly Asn Ser Tyr Asp Ile Tyr Ile Pro Ser His  
1220 1225 1230

Ile Gln Gly Asn Ile Thr Pro His Ala Ile Val Ile Leu Pro Lys  
1235 1240 1245

Thr Asp Gly Met Glu Met Leu Val Cys Tyr Glu Asp Glu Gly Val  
1250 1255 1260

Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu Gln  
1265 1270 1275

Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn Gln  
1280 1285 1290

Ile Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val Glu  
1295 1300 1305

Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln Arg  
1310 1315 1320

Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala Ser

1325

1330

1335

Val Arg Ser Gly Gly Ser Ser Gln Val Phe Phe Met Thr Leu Asn  
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Arg Asn Ser Met Met Asn Trp  
 1355 1360

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Met Ala Asn Asp Ser Pro Ala Lys Ser Leu Val Glu Ile Asp Leu Ser  
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Ser Leu Arg Asp Pro Ala Gly Ile Phe Glu Val Val Glu Leu Val Gly  
 20 25 30

Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Val  
 35 40 45

Thr Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu Glu  
 50 55 60

Ile Thr Leu Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg Asn  
 65 70 75 80

Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly His  
 85 90 95

Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser Ile  
 100 105 110

Thr Asp Leu Ile Val Asn Thr Lys Gly Asn Thr Leu Lys Glu Asp Trp  
 115 120 125

Ile Ala Tyr Ile Ser Arg Glu Ile Leu Arg Gly Leu Ala His Leu His  
 130 135 140

Ile His His Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu Leu  
145 150 155 160

Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala Gln  
165 170 175

Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro Tyr  
180 185 190

Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala Thr  
195 200 205

Tyr Asp Tyr Arg Ser Asp Leu Trp Ser Cys Gly Ile Thr Ala Ile Glu  
210 215 220

Met Ala Glu Gly Cys Pro Pro Leu Cys Asp Met His Pro Met Arg Ala  
225 230 235 240

Leu Phe Leu Ile Pro Arg Asn Pro Pro Pro Arg Leu Lys Ser Lys Lys  
245 250 255

Trp Ser Lys Lys Phe Phe Ser Phe Ile Glu Gly Cys Leu Val Lys Asn  
260 265 270

Tyr Met Gln Arg Pro Ser Thr Glu Gln Leu Leu Lys His Pro Phe Ile  
275 280 285

Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp His  
290 295 300

Ile Asp Arg Thr Arg Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu Tyr  
305 310 315 320

Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Glu Val Pro Glu Glu Gln  
325 330 335

Glu Gly Glu Pro Ser Ser Ile Val Asn Val Pro Gly Glu Ser Thr Leu  
340 345 350

Arg Arg Asp Phe Leu Arg Leu Gln Gln Glu Asn Lys Glu Arg Ser Glu  
355 360 365

Ala Leu Arg Arg Gln Gln Leu Ser Gln Glu Gln Leu Arg Glu Gln Glu

370

375

380

Glu Tyr Lys Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Cys  
 385 390 395 400

Gln Lys Glu Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Arg  
 405 410 415

Glu Ala Arg Arg Gln Gln Glu Arg Glu Gln Arg Arg Arg Glu Gln Glu  
 420 425 430

Glu Lys Arg Arg Leu Glu Glu Leu Glu Arg Arg Arg Lys Glu Glu Glu  
 435 440 445

Glu Arg Arg Arg Ala Glu Glu Glu Arg Arg Arg Val Glu Arg Glu Gln  
 450 455 460

Glu Tyr Ile Arg Arg Gln Leu Glu Glu Glu Gln Arg His Leu Glu Ile  
 465 470 475 480

Leu Gln Gln Gln Leu Leu Gln Glu Gln Ala Met Leu Leu His Asp His  
 485 490 495

Arg His Pro His Ala Gln Gln Gln Pro Pro Pro Pro Gln Gln Gln Asp  
 500 505 510

Arg Ser Lys Pro Ser Ser His Ala Pro Glu Pro Lys Pro His Tyr Asp  
 515 520 525

Pro Ala Asp Asn Ala Arg Glu Val Gln Trp Ser His Leu Ala Ser Leu  
 530 535 540

Lys Asn Asn Val Ser Pro Val Ser Arg Ser His Ser Phe Ser Asp Val  
 545 550 555 560

Pro Ser Lys Phe Ala Ala His His His Leu Arg Ser Gln Asp Pro Cys  
 565 570 575

Pro Pro Ser Arg Ser Glu Gly Leu Ser Gln Ser Ser Asp Ser Lys Ser  
 580 585 590

Glu Val Pro Glu Pro Thr Arg Gln Lys Ala Trp Ser Arg Ser Asp Ser  
 595 600 605

Asp Glu Val Pro Pro Arg Val Pro Val Arg Thr Thr Ser Arg Ser Pro  
610 615 620

Val Leu Ser Arg Arg Asp Ser Pro Leu Gln Gly Gly Gly Asn Ser Gln  
625 630 635 640

Ala Gly Gln Arg Asn Ser Thr Ser Ser Ile Glu Pro Pro Leu Leu Trp  
645 650 655

Glu Arg Val Glu Lys Leu Val Pro Arg Pro Gly Ser Gly Ser Ser Ser  
660 665 670

Gly Ser Ser Asn Ser Gly Ser Gln Pro Gly Ser His Pro Cys Ser Gln  
675 680 685

Ser Gly Ser Gly Glu Arg Phe Arg Val Arg Ser Ser Ser Lys Ser Glu  
690 695 700

Gly Ser Pro Ser Pro Arg Gln Glu Ser Ala Ala Lys Lys Pro Asp Asp  
705 710 715 720

Lys Lys Glu Val Phe Arg Ser Leu Lys Pro Ala Gly Glu Val Asp Leu  
725 730 735

Thr Ala Leu Ala Lys Glu Leu Arg Ala Val Glu Asp Val Arg Pro Pro  
740 745 750

His Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu Glu Ser Gly Thr Thr  
755 760 765

Asp Glu Phe Glu Glu Pro Val His Gln Glu Gly Ala Asp Asp Ser Thr  
770 775 780

Ser Gly Pro Glu Asp Thr Arg Ala Ala Ser Pro Asn Leu Ser Asn Gly  
785 790 795 800

Glu Thr Glu Ser Val Lys Thr Met Ile Val His Asp Asp Val Glu Ser  
805 810 815

Glu Pro Ala Met Thr Pro Ser Lys Glu Gly Thr Leu Ile Val Arg Gln  
820 825 830

Thr Gln Ser Ala Ser Ser Thr Leu Gln Lys His Lys Ser Ser Ser Ser  
835 840 845

Phe Thr Pro Asp Phe Thr Asp Pro Arg Leu Leu Leu Gln Ile Ser Pro  
850 855 860

Ser Gly Thr Thr Val Thr Ser Val Val Gly Phe Ser Cys Asp Gly Leu  
865 870 875 880

Arg Pro Glu Ala Ile Arg Gln Asp Pro Thr Arg Lys Gly Ser Val Val  
885 890 895

Asn Val Asn Pro Thr Asn Thr Arg Pro Gln Ser Asp Thr Pro Glu Ile  
900 905 910

Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu  
915 920 925

Trp Gly Val Asn Leu Leu Val Gly Thr Glu Ser Gly Leu Met Leu Leu  
930 935 940

Asp Arg Ser Gly Gln Gly Lys Val Tyr Pro Leu Ile Ser Arg Arg Arg  
945 950 955 960

Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn Val Leu Val Thr Ile  
965 970 975

Ser Gly Lys Lys Asp Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu Arg  
980 985 990

Asn Arg Ile Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln Gly Trp  
995 1000 1005

Thr Thr Val Gly Asp Leu Glu Gly Cys Val His Tyr Lys Val Val  
1010 1015 1020

Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys Ser Ser  
1025 1030 1035

Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys Phe Met  
1040 1045 1050

Ala Phe Lys Ser Phe Gly Glu Leu Leu His Lys Pro Leu Leu Val  
1055 1060 1065

Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Tyr Gly  
1070 1075 1080

Ser Cys Ala Gly Phe His Ala Val Asp Val Asp Ser Gly Ser Val  
1085 1090 1095

Tyr Asp Ile Tyr Leu Pro Thr His Ile Gln Cys Ser Ile Lys Pro  
1100 1105 1110

His Ala Ile Tyr Ile Leu Pro Asn Thr Asp Gly Met Glu Leu Leu  
1115 1120 1125

Val Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr Gly Arg  
1130 1135 1140

Ile Thr Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro Thr Ser  
1145 1150 1155

Val Ala Tyr Ile His Ser Asn Gln Thr Met Gly Trp Gly Glu Lys  
1160 1165 1170

Ala Ile Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp Gly Val  
1175 1180 1185

Phe Met His Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys Gly Arg  
1190 1195 1200

Asn Asp Lys Val Phe Phe Ser Ser Val Arg Ser Gly Gly Ser Ser  
1205 1210 1215

Gln Val Tyr Phe Met Thr Leu Gly Arg Thr Ser Leu Leu Ser Trp  
1220 1225 1230

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Pro Pro Leu Pro Thr Arg  
1 5